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**A COMPARATIVE ANALYSIS OF
PORTUGUESE PARTIES' LEGISLATIVE
PROGRAMS IN 2024**

A Multidimensional Study

Mafalda Trindade Rodrigues Gomes do Paço

Master Thesis

presented as partial requirement for obtaining a Master's Degree in Data Science and Advanced Analytics

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by

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Master Thesis presented as partial requirement for obtaining the Master's degree in Data Science and Advanced Analytics, with a specialization in Data Science.

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STATEMENT OF INTEGRITY

I hereby declare having conducted this academic work with integrity. I confirm that I have not used plagiarism or any form of undue use of information or falsification of results along the process leading to its elaboration. I further declare that I have fully acknowledged the Rules of Conduct and Code of Honor from the NOVA Information Management School.

[Lisbon, 28.06.2024]

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ABSTRACT

The intersection of computer science, political science, and psychology is becoming increasingly richer in techniques. In this study, we analyze the Portuguese political parties' legislative programs and electoral interviews to attempt to get a better understanding of what differentiates them, and if those differences are correlated to their ideological spectrum positioning. To accomplish a multidisciplinary approach we use two distinct lenses; an examination of the sentiment in their rhetoric, and their moral profiles. To perform the sentiment analysis, the pysentimiento analyzer was employed, returning the negative and positive sentiments detected in the text. For the moral analysis, the Moral Foundations Theory was used as a basis, in tandem with the Moral Foundations Dictionary for the Portuguese language. Results indicate that the differences found between parties are correlated with how well-established they are in parliament and their ideological beliefs.

Keywords: Politics; Moral Foundations Theory; Sentiment Analysis; Text Mining

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ACRONYMS

AD	Aliança Democrática (<i>pp. 7, 9, 15, 18, 21, 22, 24</i>)
BE	Bloco de Esquerda (<i>pp. 7, 9, 15, 17, 19, 22</i>)
CDS-PP	Centro Democrático e Social – Partido Popular (<i>p. 7</i>)
CDU	Coligação Democrática Unitária (<i>pp. 7, 9, 19, 22, 24</i>)
CH	Chega (<i>pp. 7, 9, 15, 19, 21, 23, 24</i>)
IL	Iniciativa Liberal (<i>pp. 7, 9, 15, 19, 21–23</i>)
L	Livre (<i>pp. 7, 9, 17, 19, 22, 24</i>)
LWIC	Linguistic Inquiry and Word Count (<i>pp. 12, 17, 23</i>)
MFD	Moral Foundations Dictionary (<i>p. 6</i>)
MFT	Moral Foundations Theory (<i>pp. 1, 4, 12</i>)
NLP	Natural Language Processing (<i>p. 3</i>)
PAN	Pessoas–Animais–Natureza (<i>pp. 7, 9, 17, 19, 22, 24</i>)
PCP	Partido Comunista Português (<i>p. 7</i>)
PEV	Partido Ecologista "Os Verdes" (<i>p. 7</i>)
PS	Partido Socialista (<i>pp. 7, 9, 15, 18, 21, 22, 24</i>)
PSD	Partido Social Democrata (<i>p. 7</i>)
TM	Text Mining (<i>pp. 1, 3</i>)

INTRODUCTION

The social contract, as conceptualized by Rousseau (1968), implies we sacrifice our natural freedom for political freedom. In the context of representative democracy, the government serves as a means through which we pursue the "general will", understood as the will of the people. Electoral programs become renderings of that will, proposing a governance strategy. For the average citizen, voting on these programs and their representatives is the primary way they voice their will. This expression, however, is inherently constrained, and even an informed voter is operating under conditions of incomplete and imperfect information.

The emotional tone of political messages plays a crucial role in shaping public perception. According to Cope and Sandys (2010), effective persuasion hinges on emotional appeals. With Text Mining (TM) techniques, we're able to go beyond words. We can quantify the emotional charge a document displays. The emotional charge informs us of the framing of a given issue, whether it's perceived as a problematic issue that needs to be restructured, or a policy success to maintain. It reveals how satisfied with the current state the parties are. The support for issues and satisfaction with what is done are some of the most fundamental distinguishing aspects between parties and a cornerstone in a party's identity.

The framing of a topic is heavily influenced by the moral compass of the speaker. How come that facing the same problem, we get such disparate solutions? Take the housing crisis in Lisbon as an example. The policies addressing this same issue range from limiting local accommodation and increasing public housing to ending rent freeze and lowering taxes on local accommodation and construction. Although there are clear economic motivations behind these solutions, they still regard a human right. The ability to simultaneously consider the social and economic consequences (and the inability to concern oneself equally with the broader implications as with the human concerns) has moral foundations.

Moral Foundations Theory (MFT) gives us a framework to understand these divergent approaches. The theory proposes that morality is rooted in five foundations, with the moral mind emerging from the varying influence of each dimension. The moral domain can be thought of as "prescriptive judgments of justice, rights, and welfare pertaining to how people ought to relate to each other", as defined by Turiel (1983). Legislative programs reflect these moral principles, translating them into policies. Haidt et al. (2009) implements MFT to move beyond a single left-right dimension, and dive deeper into the "culture war" in the United States, that divides the spectrum. They found that those on the left end of the spectrum held moral values based primarily on two individualizing foundations, whereas those on the right had moralities based relatively equally on all five foundations. This mismatch in significance attributed to each foundation results in a chasm that is hard to bridge. The struggle of the left to recognize the

other three foundations as valid moral concerns is an obstacle to productive communication and a hindrance in politics. Revealing these distinctions allows for a more comprehensive interpretation of the discourse from either side of this division.

This focus on the language employed by parties comes from the idea that language and thoughts influence each other. As Boroditsky (2011) argues, language shapes the most fundamental dimensions of human experience. Language can be thought of as a cognitive toolkit, encapsulating knowledge and worldview. It is not only a tool to communicate to others, but it sets constraints on our thoughts, limiting what we're even able to think about and, therefore, shaping our reality. The language we choose to use when communicating something can inform the listener about our worldview, beyond the scope of what we're saying.

The sentiment analysis, complemented by the moral investigation, will clarify the ethical principles that differentiate their platforms, and answer the question of what differentiates the parties rhetoric. This approach offers a comprehensive comparative perspective of the political landscape that makes up the Portuguese Parliament in 2024, illuminating how language, morality and emotional tone intertwine to shape each party.

RELATED WORK

Between political debates, commentators, humorists' takes, and family and friends' opinions, we are flooded with information to ground our vote in. Understanding the mechanisms through which we assimilate political information is a crucial step in the development of accessible analytical frameworks. Popkin (2020) sheds light on this process, asserting that constituents engage in low-information rationality, relying on cues and information shortcuts to create narratives around candidates and policies. In an era characterized by information overload, it is essential to offer insightful and comprehensible analyses of the political landscape. This study aims to create visual representations that effectively encapsulate key features of political parties. Visualizations facilitate comprehension by enabling viewers to discern patterns and relationships more readily (Bertin, 1981). It is anticipated that presenting the findings through such visual formats will render the information more digestible, aligning with the information assimilation practices of constituents.

Being a politically active citizen necessitates staying informed amidst an ever-expanding volume of information that evolves continually. The increasing complexity of the political system can largely be attributed to the proliferation of data, which underscores the significance of automatic content analysis as a methodological tool for managing and interpreting this information.

The analysis of rich sources of political texts, augmented with Natural Language Processing (NLP) and TM techniques will hopefully bring a new perspective to our understanding of the Portuguese political landscape. Grimmer and Stewart (2013) demonstrate how these techniques enable the systematic analysis of large-scale text collections, facilitating important insights that otherwise could fall lost to the noise. Their work advocates that language models are invaluable tools to amplify the careful reading that political texts call for.

Bridging the use of these frameworks with the study of the Portuguese political system, C. Costa et al. (2021) examined the coherence across political programs and party communication on Twitter. His research found similarities between different parties' communication styles, observing that the most similar tweets were Bloco de Esquerda, Pessoas–Animais–Natureza, and Chega, which isn't consistent with their ideological orientations. He identified a gap in the study of the similarities of political party programs across the ideological spectrum.

Analyzing the effect the Brazilian Presidential elections of 2022 had on polarization on social media, F. S. Costa (2023) concluded that it was more affective than ideological. The social media user's sentiments towards the candidates were stronger than the ones exhibited towards the topics. The use of sentiment analysis by Orellana and Bisgin (2023) also proved conclusive when exploring New Zealand's political party manifestos. Through sentiment analysis they

were able to estimate the support each party had for a given topic, allowing for a comparative analysis of their stances on each subject.

The stances on issues are motivated in part by moral convictions. MFT, proposed by Haidt and Graham (2007), offers a useful way to conceptualize and measure such convictions. MFT reasons that moral intuitions develop from innate psychological processes that developed alongside cultural institutions and practices. They reduced the panoply of human values to a manageable set of constructs: the five moral foundations. These foundations can be divided into two categories:

Individualizing foundations

Care/Harm encompasses concerns for the suffering of others, with virtues such as caring and compassion and transgressions such as cruelty and aggression. This foundation is related to our evolution as mammals with attachment systems.

Fairness/Cheating encompasses concerns about unfair treatment, inequality, and notions of justice, making us sensitive to indications of whether another person is likely to be a good partner for collaboration. It's related to our evolutionary process of reciprocal altruism.

Binding foundations

Loyalty/Betrayal encompasses concerns related to obligations of group membership, such as loyalty, self-sacrifice, and vigilance against betrayal. It's related to our history as tribal creatures living in kin-based groups and able to form alliances. It can also be referred to as *Ingroup*.

Authority/Subversion encompasses concerns related to social order and the obligations of hierarchical relationships, such as obedience, proper role fulfillment, and respect for traditions. It was shaped by our primate history of hierarchical social interactions and the challenge of forging relationships that benefited us within the hierarchy.

Sanctity/Degradation encompasses concerns about the behavioral immune system, physical and spiritual contagion. It's based on the idea that the body is a temple that can be desecrated by immoral activities and contaminants. Some of its underlying virtues are self-discipline, chastity, and spirituality. It was shaped by the psychology of disgust and contamination, a response to the adaptive challenge of the omnivore's dilemma - faced with an enormous number of potential food, the danger of eating something harmful or too much of something good is ever-present.

Haidt and Graham (2007) extrapolated these psychological processes to politics and examined the morality concerns between liberals and conservatives, the two ends of the political spectrum in the U.S. They found evidence that political liberals construct their moral systems primarily upon two foundations – Care/Harm and Fairness/Cheating, the Individualizing foundations. In contrast, political conservatives construct their moral systems using a more even combination of all five foundations. See results in Figure 2.1.

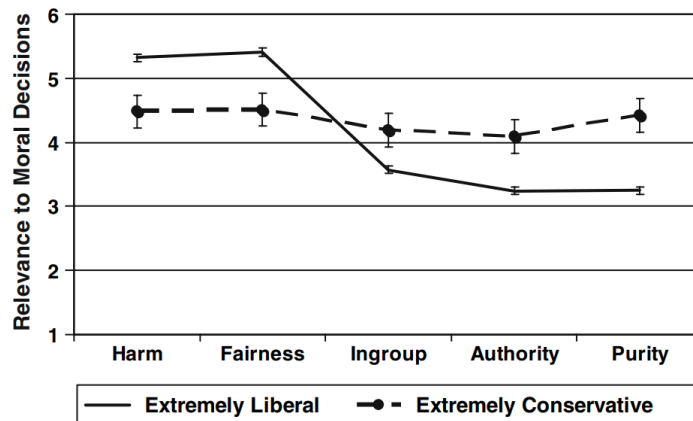


Figure 2.1: Moral relevance by foundation for extreme liberals and conservatives. 1 = not relevant at all, 6 = always relevant (Haidt & Graham, 2007)

This liberal/conservative dichotomy isn't applicable in the Portuguese context, where across the left-right spectrum you can find both liberal and conservative ideals. Take Bloco de Esquerda and Coligação Democrática Unitária - while they can be considered close on the left side of the spectrum, the former has socially liberal positions, while the latter is socially conservative. A better representation of the Portuguese party's positions is with a two-dimensional graph, as seen in Figure 2.2, where the x-axis is left-right and the y-axis is liberal-conservative. This political compass is merely illustrative, not meant as an accurate representation of the Portuguese political space.

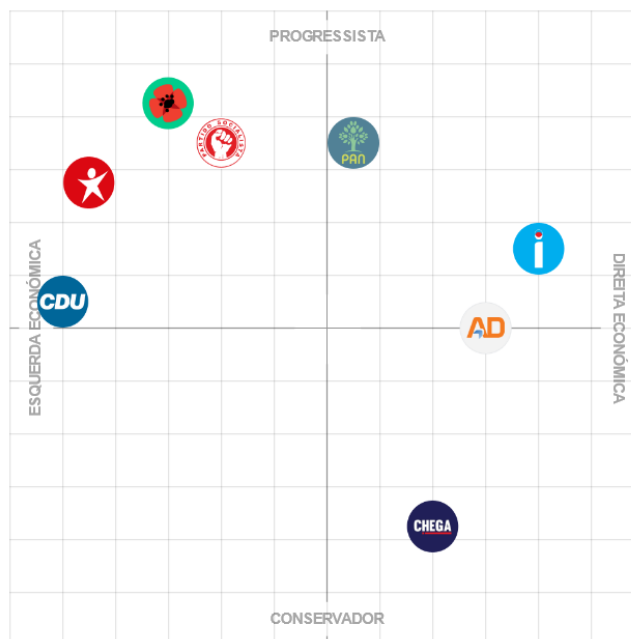


Figure 2.2: Portuguese Political Compass (Observador, 2024)

Graham et al. (2009) performed different studies, varying in the degree to which they relied on conscious beliefs and intuition. The most relevant study for this research examined the relationship between self-identification on the political spectrum and moral foundations through a quantitative content analysis of moral texts. This research introduced the Moral Foundations Dictionary (MFD) and employed the Linguistic Inquiry and Word Count program (LIWC; Tausczik and Pennebaker (2010)) to systematically analyze linguistic patterns associated with moral reasoning. They did this by calculating the ratio of moral words that were considered “liberal” or “conservative” over the total number of words. Liberals used Care and Fairness words more frequently than conservatives, and conservatives used Authority and Purity words more frequently than liberals.

Parker et al. (2019) evaluated whether this differing morality hypothesis would apply to Australian politics. They reached similar conclusions to Graham et al. (2009) when using their methodology. But Parker et al. (2019) expanded the analysis, calculating the weighted log odds and grouping the speeches by prime minister as well as party. Their findings demonstrate that moral foundations in political speeches are variable and driven by individual differences and context more than political orientations.

There was a language barrier to test the hypothesis in the Portuguese context, as the frameworks rely on a dictionary. Zúquete et al. (2023) overcame this obstacle and developed a MFD in European Portuguese. The dictionary was initially applied to transcripts from the Assembly of the Republic, using this new lens to understand the Portuguese political spectrum.

Building on these foundational studies, this study aims to bridge the gap identified by F. S. Costa (2023), analyzing the 2024 electoral programs in a comparative and multidimensional study to identify what differentiates the parties, and if it’s related to ideological beliefs.

STUDY CONTEXT

In Figure 2.2 we saw a first glimpse into the Portuguese political landscape. While the political compass does a good job of giving us an estimation of the parties' positioning, it can never be fully encompassing or a defining identity placement of the parties. To get a better understanding of the subject of this research's analysis, the parties will be introduced. The parties in Parliament today are as follows

- *Aliança Democrática (AD)*, with 80 seats in Parliament, is a right-wing coalition between Partido Social Democrata (PSD), a liberal-conservative party, and Centro Democrático e Social – Partido Popular (CDS-PP), a Christian conservative party. Both are part of the European People's Party.
- *Partido Socialista (PS)*, with 78 seats is a center-left social-democratic party, part of the Party of European Socialists.
- *Chega (CH)*, with 50 seats, is a far-right nationalist, conservative and populist party, part of the Identity and Democracy Party.
- *Iniciativa Liberal (IL)*, with 8 seats, is a right-wing neo-liberal party, part of the Alliance of Liberals and Democrats for Europe.
- *Bloco de Esquerda (BE)*, with 5 seats, is a left-wing democratic socialist, anti-capitalist party, part of the Fourth International.
- *Livre (L)*, with 4 seats, is a left-wing progressive, green, and socialist political party, part of the European Green Party and the European Spring.
- *Coligação Democrática Unitária (CDU)*, with 4 seats, is a far-left communist coalition between Partido Comunista Português (PCP), a Marxist-Leninist party, and Partido Ecologista "Os Verdes" (PEV), an eco-socialist party. They're part of the The Left in the European Parliament.
- *Pessoas–Animais–Natureza (PAN)*, with 1 seat, is a center-left environmentalist, animal rights, and welfare-focused party, part of the European Green Party and the Animal Politics EU.

DATA AND METHODS

This section introduces the data used in this study and the techniques used to analyze the data.

4.1 Data

Political programs are documents that state the aim and principles of a party. This makes them the most important document regarding a party's identity, as they ground the party. This study analyzes the 8 parties in Parliament and their positions.

To accomplish the study's objectives, the official 2024 legislative programs were collected. The participating parties in this study are PS, CH, IL, BE, L, PAN, and the coalitions AD and CDU. These programs can be obtained on the respective parties' official websites.

PS	CH	IL	BE
<p>PLANO DE AÇÃO PARA PORTUGAL INTEIRO 2024</p> <p>Estou certo que, como tantas vezes no passado, demonstraremos a força do PS e saberemos estar à altura de dar ao país, uma vez mais, a confiança de um projeto credível para um Portugal inteiro.</p> <p>Pedro Nuno Santos</p>	<p>Programa Eleitoral Carta do presidente LIMPAR PORTUGAL</p> <p>Meus caros, Volvidos dois anos, estamos novamente à beira de eleições legislativas. Ninguém esperava que o sufrágio se realizasse este ano, pois o PS governava com maioria absoluta e, por isso, seria de esperar que a legislatura cumprisse os seus quatro anos.</p>	<p>PROGRAMA ELEITORAL POR UM PORTUGAL COM FUTURO LEGISLATIVAS 2024</p> <p>Mensagem Do Presidente O que diremos aos jovens portugueses se não tivermos a coragem, agora, de mudar o país? Foi esta a pergunta que me coloquei vezes sem conta durante as semanas em que este Programa Eleitoral esteve a ser desenvolvido.</p>	<p>Programa eleitoral do Bloco de Esquerda Legislativas 2024 FAZER O QUE NUNCA FOI FEITO</p> <p>1. O Governo de maioria absoluta do PS caiu por responsabilidade própria. A instabilidade governativa e a promiscuidade entre a gestão pública e os interesses privados são apenas parte do processo de degradação política.</p>
L	PAN	AD	CDU
<p>CONTRATO COM O FUTURO Programa do LIVRE às eleições legislativas de 2024</p> <p>Perante o medo, a esperança. Poucas eleições terão sido tão importantes como estas legislativas de 2024, onde se define o futuro de Portugal. No ano em que celebramos os 50 anos da nossa democracia, o país está colocado perante uma escolha clara.</p>	<p>COMPROMISSO COM AS PESSOAS, OS ANIMAIS E A NATUREZA Cuidar das Pessoas, Defender os Animais, Proteger a Natureza</p> <p>A nossa Agenda 24-28 personifica o nosso compromisso para um futuro verde, que cuide das Pessoas, que defenda os Animais e proteja a Natureza. Neste documento ficará a conhecer as nossas prioridades para o futuro, colocando as causas que representamos no centro da nossa ação política.</p>	<p>Programa Económico da Aliança Democrática "REFORMAR A ECONOMIA PARA PÓR PORTUGAL NO PELOTÃO DA FRENTE"</p> <p>1.1. A nossa ambição O nosso destino está nas nossas mãos. A AD propõe aos portugueses um Programa Económico de Reformas Estruturais geradoras de uma Mudança Ambiciosa e Realista da Economia Portuguesa</p>	<p>Programa eleitoral do PCP Legislativas 2024 POLÍTICA PATRIÓTICA E DE ESQUERDA – SOLUÇÕES PARA UM PORTUGAL COM FUTURO</p> <p>1.1. 25 de Abril, sempre – É hora de mudar de política No ano em que comemoramos o 50.º aniversário do 25 de Abril, esse momento ímpar da história nacional continua a constituir uma referência para o futuro que é preciso construir.</p>

Figure 4.1: Snippets of the legislative programs

To get a broader scope of the parties' communication, interviews with their leaders were retrieved and added to the corpus. Incorporating interviews enriches the study by providing a more human and nuanced dimension to the corpus, complementing the formal legislative programs. These conversations with the party leaders give us information on their personal narratives and their guiding philosophies, which shape the party.

	Renascença	Expresso	Público	RTP
AD	✓		✓	✓
BE	✓	✓	✓	✓
CDU	✓	✓	✓	✓
CH	✓	✓	✓	
IL		✓	✓	✓
L	✓	✓	✓	
PAN	✓	✓	✓	✓
PS	✓			✓

Figure 4.2: Sources of interviews

The different data sources were combined, and the data preprocessing was conducted according to the following pipeline (as seen in Figure 4.3):



Figure 4.3: Data preprocessing

1. **Split by sentence:** Split the text into sentences to have small, clean units of text and avoid context overlap and sequence length limitations.
2. **Join hyphenated words:** Hyphenated words were often split due to spacing issues. This step ensures that such words are correctly joined, preserving the intended meaning. For example, "conhe-~~ln~~ cer" would be joined to "conhecer".
3. **Correct orthography:** The Portuguese Language Orthographic Agreement of 1990, that came into force in 2009, is an international treaty whose purpose is to create a unified orthography for the Portuguese language. While it's the official orthography, there is still some resistance from some conservatives to adopt it. In this step, the spelling was converted into the official standard. "Proteçção", for instance, is converted to "Proteção".
4. **Lowercase:** The text was converted to lowercase to standardize the data. This normalization step reduces the dimensionality of the text, treating words with different cases as the same token, which improves consistency.

5. **Remove punctuation:** Punctuation marks were removed as they often do not contribute any meaning and can introduce noise. However, punctuation carries significant information in the context of sentiment analysis, in which case this step was skipped.
6. **Remove stopwords:** Stopwords are common words (e.g., 'a', 'que', 'para') that frequently occur in text but do not carry significant meaning. Removing them helps to reduce the data size and improve computational efficiency. The Portuguese package from NLTK was used to remove the stopwords.

4.2 Sentiment Analysis

Sentiment analysis is an analytical lens that will provide a new understanding of a party's priorities, values, and communication style, giving insight into the party itself. By analyzing the sentiment expressed in these documents, we can detect the emotional undertones the parties have about the issues, which reflect their stance on various issues. For instance, a party's legislative program might exhibit positive sentiment when discussing education policies, indicating optimism and satisfaction with the quality of the students graduating from national institutions. Negative sentiment in discussions about the current state of the national healthcare service reveals concern and a call for reform. To provide a meaningful analysis, the scope of the analysis was limited to selected topics. The topics selected are Education, Housing, Culture, Health, Justice, and Foreign Policy. They were considered pillars of societal governance, and relevant across political contexts, making for a robust portrayal of the party's discourse.

The sentiment analyzer utilized is the *pysentimiento* (Pérez et al., 2023), tailored to Portuguese. The data is pre-processed according to the pipeline previously detailed, and labeled according to chapter. The programs are structured by chapter, where each chapter addresses an issue. The sentiment for each data point is predicted, resulting in positive, neutral, and negative probabilities, and averaged by topic.

As a demonstration:

1. *"A nossa missão é limpar Portugal desta corrupção e desta podridão que desacredita as instituições e leva os nossos jovens a emigrarem, enquanto o país importa pessoas oriundas de culturas e civilizações completamente distintas das nossas, colocando em risco a continuidade da cultura e tradições portuguesas."* - {'NEG': 0.849, 'NEU': 0.097, 'POS': 0.054}
2. *"A cultura é alegria, qualidade de vida, imaginação, comunidade; mas é também promotora de criatividade, experimentação, investigação e inovação e, por isso, central na economia do futuro."* - {'NEG': 0.029, 'NEU': 0.708, 'POS': 0.263}

4.3 Moral Foundations Analysis

To uncover the moral foundations of the different parties, and extend with this lens their comparative analysis, the method of Graham et al. (2009) was replicated. The Linguistic Inquiry and Word Count (LWIC) program (Tausczik & Pennebaker, 2010), was used with the MFT dictionary translated by Zúquete et al. (2023). The logic of LWIC is that “people’s language can provide rich insights into their psychological states, including their emotions, thinking styles, and social concerns”. The program calculates the percentages of total words in the text that match each of the dictionary categories, the five moral foundations in our case. By examining word frequencies in these categories, LWIC can infer the moral dimensions that frame the party’s rhetoric.

The number of words in the text that belong to category C_j is calculated as:

$$N_{C_j} = \sum_{i=1}^T I(w_i \in C_j) \quad (4.1)$$

where $I(w_i \in C_j)$ is an indicator function that equals 1 if w_i belongs to C_j and 0 otherwise. The frequency of words in category C_j is then calculated as:

$$Frequency_{C_j} = \frac{N_{C_j}}{T} \quad (4.2)$$

where T is the total number of words in the text.

However, absolute word frequency doesn’t account for context. Monroe et al. (2017) presented a method using weighted log odds to study the partisan framing and polarization over time in the United States Senate. The weighted log odds ratio is a statistical method used to compare the usage of words between different groups or documents while adjusting for overall word frequencies. They modified the log-odds ratio by incorporating a z-score to control for the amount of variance in a word’s frequency, making the measure comparable across words, regardless of their frequency distributions. Furthermore, they used counts from a corpus to provide a prior count for words, shrinking the observed word frequencies toward their prior frequencies in a large corpus. The weighted log-odds were calculated following the methodology from Parker et al. (2019), where a prior is used to stabilize the estimates. The weighing of log odds with a Dirichlet prior provides evidence of the words that each party uses relatively more than the combined other parties, identifying distinctive vocabulary.

LWIC provides a broad understanding of the moral dimensions, while weighted log odds complement the moral analysis by offering detailed insights into the specific moral conventions of the parties. Using both methods together can cross-validate findings, enhancing the robustness of the analysis.

The weighted log-odds ratio for a word w is computed as the logarithm of the odds ratio of the word’s frequency in one group compared to another group, with weights assigned to each word based on their importance in distinguishing between the groups. Logging the odds ratio provides a symmetric measure when comparing the use of word w across different documents.

The log odds ratio of a word w between documents i and j is

$$\delta_{iw} = \log \left(\frac{y_{iw} + \alpha_w}{n_i + \alpha_0 - (y_{iw} + \alpha_w)} \right) - \log \left(\frac{y_{jw} + \alpha_w}{n_j + \alpha_0 - (y_{jw} + \alpha_w)} \right) \quad (4.3)$$

where y_{iw} and y_{jw} are the counts of word w in documents i and j , n_i and n_j are the total word counts in documents i and j , α_w is the parameter for word w in the Dirichlet prior, and α_0 is the sum of all α_w parameters.

The Dirichlet Prior smooths word counts and prevents words from having a zero probability, which stabilizes the estimates. The smoothing parameter, α , was set to 0.01. The next step was calculating the total word counts for the entire corpus. Having the count for every word, we can then calculate the Dirichlet parameter for each word, which represents the prior belief about the frequency of word w :

$$\alpha_w = \frac{\alpha \cdot c_w}{\sum_{w=1}^W c_w} \quad (4.4)$$

where W is the total number of unique words, c_w is the count of word w and α is the smoothing parameter.

α_0 is the sum of all α_w , calculated as:

$$\alpha_0 = \sum_{w=1}^W \alpha_w \quad (4.5)$$

2024 LEGISLATIVE PROGRAMS ANALYSIS

5.1 Sentiment Analysis

Figure 5.1 illustrates the predicted negative and positive feelings regarding the selected issues. These patterns reveal how political entities craft their messages to resonate with the intended audiences, leveraging emotional tone as a tool. There is a disparity in sentiment expression, with CH, IL and BE exhibiting the most pronounced emotional responses. BE has a long-standing opposition to the government, which is clear by the overall negative emotions expressed. IL has strong "guerrilla marketing" tactics that position them as anti-establishment. These tactics tend to go with strong emotional undertones as seen in the sentiment analysis of CH.

The interviews stand out with pronounced negative emotions across the board. These interviews focus a lot on the parties' policy plans. These plans will necessarily be tied to negative sentiments, as they are a positioning against the current situation, and are callings for reform. By framing the issues in a negative light, regardless of their actual level of discontent, they influence the listeners' perceptions, intensifying their criticisms and desire for change.

In Figure A.1 we can see that AD has the most subdued emotional undertones of all the parties. The majority party, having more responsibility for governance and policy implementation, seems to adopt a more restrained communication style that projects stability and responsibility. In contrast, the anti-establishment parties position themselves as challengers of the status quo and require emotionally charged discourse to convey their dissatisfaction and rally supporters. This discrepancy might be a strategic use of rhetoric, to reflect competence and stability for the former, and incite outrage for the latter. This line of reasoning would also explain why PS has such strong positive and weak negative undertones, having had a majority of seats in Parliament since 2019 and consequently having a lot of responsibility over the state of governance.

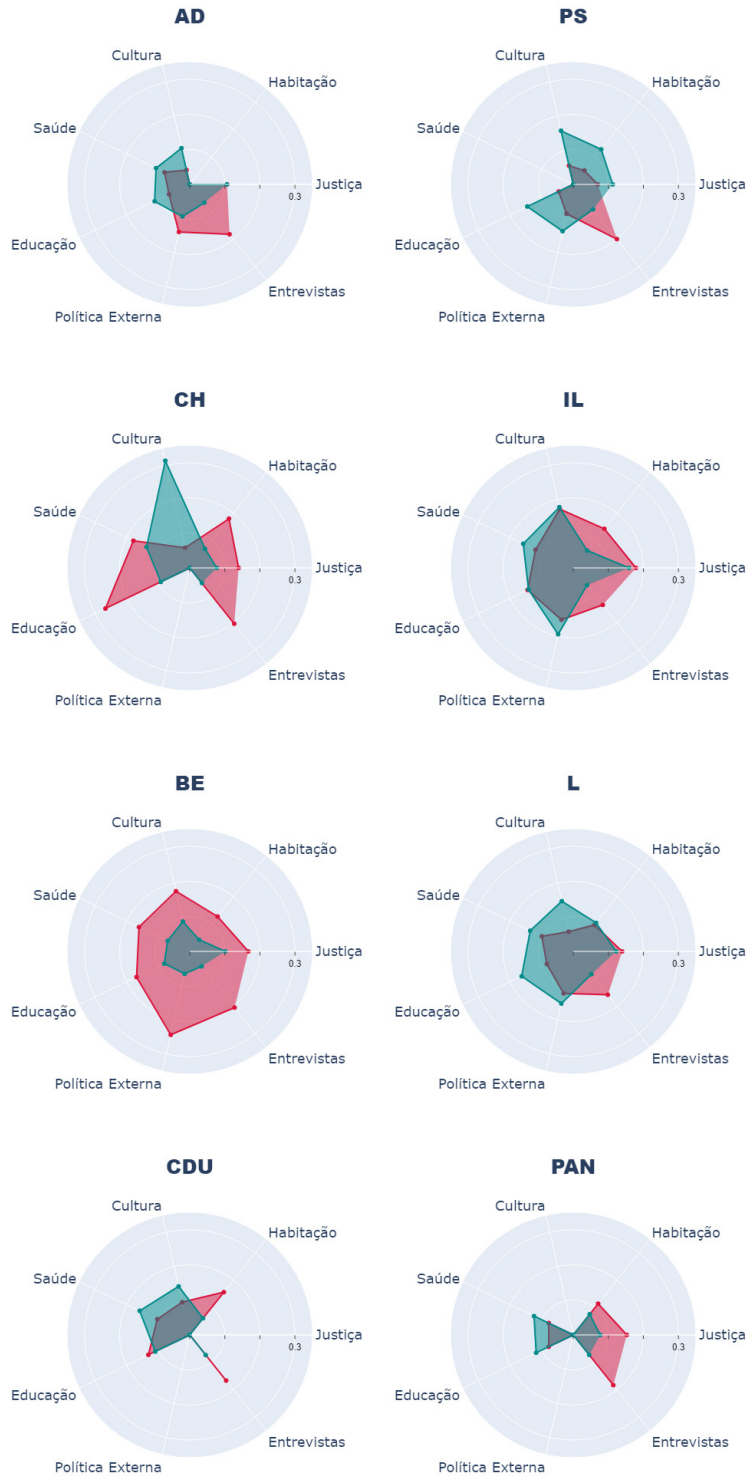


Figure 5.1: Sentiment analysis per topic, where red illustrates negative sentiments and green positive one

5.2 Measuring Morality

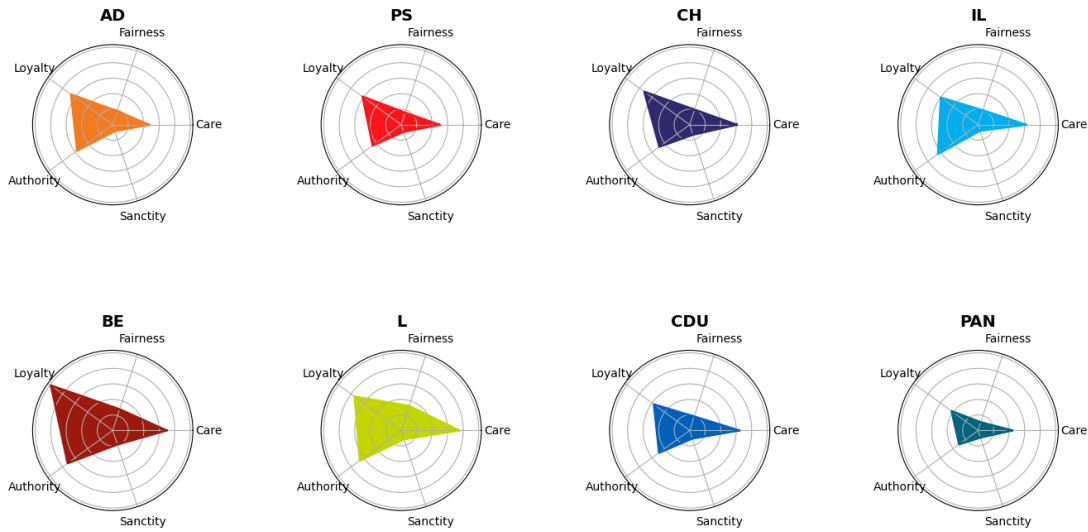


Figure 5.2: Moral foundation distribution across parties

Figure 5.2 illustrates the distribution of moral foundations across different parties, calculated using the LWIC technique and applied to both interviews and legislative programs. The decision to combine these texts was based on the similarity in results, indicating that the LIWC analysis did not yield significant distinctive insights when applied separately. The analysis provides an overview of the moral dimensions present in the legislative communications of each party.

Notably, the patterns indicate that *Loyalty*, *Care*, and *Authority* are the most prominent moral dimensions expressed by these parties. The dominance of these foundations suggests that these values are central to the political discourse, reflecting underlying societal emphases. This observation appears to contradict the Individualizing/Binding foundations split identified by Graham et al. (2009), which differentiates liberals from conservatives. The Individualizing foundations (*Care* and *Fairness*) are typically associated with liberal ideologies, while conservatives also encompass the Binding foundations (*Loyalty*, *Authority*, and *Sanctity*) in their moral compass.

As evidenced in Figure 5.2, the political parties exhibit similar moral profiles, irrespective of their ideological stance. This suggests a convergence in moral rhetoric among the parties. The closest party we have to an outlier of this pattern is L, which, while following the general trend, shows an emphasis on *Fairness* words. There are, however, variations in the intensity of moral language use, with BE using moral words most frequently, and PAN using them the least. This variation is visually evident in the radar charts, where the size of the radar for each party corresponds to the frequency of moral word usage. Despite these differences, the overall moral foundations across parties remain comparable.

The uniformity observed in the use of moral words across parties could imply several underlying factors. Firstly, it might reflect a strategic alignment in political communication, where parties, regardless of their core ideology, adopt similar moral rhetoric to appeal to a

broader electorate. Secondly, it could be a result of cultural or societal influence shaping the moral language used by these parties. Thirdly, it could be a result of the limitations of the translated dictionary, failing to capture the Portuguese cultural context.

AD	PS	CH	IL	BE	L	CDU	PAN
serviços	nacional	nacional	nacional	nacional	nacional	nacional	nacional
nacional	serviços	segurança	serviços	serviços	serviços	defesa	proteção
segurança	segurança	serviços	segurança	serviço	valor	serviços	bem
valor	bem	justiça	valor	cuidados	proteção	segurança	valor
justiça	proteção	bem	bem	valor	segurança	combate	serviços
proteção	valor	combate	cuidados	segurança	bem	serviço	bemestar
serviço	combate	combater	defesa	combate	cuidados	valorização	segurança
bem	valorização	proteção	serviço	justiça	combate	proteção	combate
nacionais	cuidados	famílias	justiça	proteção	serviço	valor	associações
valorização	cooperação	comunidades	exemplo	família	conservação	respeito	cuidados

Figure 5.3: Moral words most frequently used in the legislative program

AD	PS	CH	IL	BE	L	CDU	PAN
líder	líder	exemplo	valor	imigrantes	exemplo	exemplo	exemplo
aliança	respeito	bem	imigração	líder	nacional	nacional	valores
valor	bem	justiça	santos	santos	santos	bem	grupo
liderança	nacional	defesa	exemplo	defende	valor	grupos	proteção
serviços	respeitar	nacional	líder	serviço	família	santos	bem
defendeu	posição	valor	bem	exemplo	bem	benefícios	segurança
nacional	desafios	imigrantes	posição	dignidade	defendeu	valor	nacional
estrangeiros	desafio	honestamente	nacional	respeito	serviço	guerra	ordenado
segurança	ataques	valores	conjunto	justiça	classe	segurança	defende
nobre	permita	imigração	famílias	segurança	justiça	posição	equilíbrio

Figure 5.4: Moral words most frequently used in the interviews

Care	Fairness	Loyalty	Authority	Sanctity
segurança	justiça	nacional	serviços	conservação
proteção	igualdade	famílias	respeito	exploração
combate	desigualdades	comunidades	desafios	doença

Figure 5.5: Moral words most frequently used by foundation

Examining the words the parties reach for the most in the programs and interviews, illustrated in Figure 5.3 and in Figure 5.4 respectively, we get a more in-depth understanding of how the different morality foundations are employed by the parties. Figure 5.5 has the most common words by foundation.

There is consistency when comparing the moral words present in the program and utilized by the party leader in interviews. Words like "*nacional*", "*serviços*", and "*segurança*" are the most common, referring to themes of governance.

AD shows a clear focus on leadership in the interviews, with words "*líder*" and "*liderança*" and "*aliança*", showing a strategic positioning, which is interesting with the hindsight of them winning the majority of seats. The moral foundations associated with the words in both the program and interviews are *Authority*, *Care*, and *Loyalty*. PS, their biggest competitor is also

deliberate with their linguistic choices, using "*desafio*" very frequently in interviews. This is not, however, an admission of struggle, but seems to be a strategy that appeals to competence. As seen previously with the sentiment analysis, this appeal to stability and competence is supported by the linguistic choices. "*desafio*" appears to be mentioned alongside solution-based words - reinforcing competence - or be used to set expectations - providing a sense of responsibility. While *Care* is the foundation with the most common words in the program, in the interviews it is *Authority*.

CH pivots from "*combate*" in the programs, to "*defesa*" in the interviews. The interview discourse also had a big focus on "*imigração*", which is seen in IL and BE as well. IL shifts to using *Loyalty* and *Authority* words most frequently in the interviews. BE's program appears to have a focus on public services, mentioning "*serviços*" frequently, and social justice, carried on in interviews with words like "*dignidade*". Social concerns are also present in interviews with L, with mentions of "*família*" and "*classe*", and in PAN, with discourse about "*ordenado*".

CDU has the biggest difference in words used, appearing to have a social welfare discourse in the program, while mentioning "*guerra*" often in interviews. This is due to their controversial stance in the war in Ukraine.

Across all the interviews, there is a pattern of utilizing *Authority* words more frequently than in the programs.

Looking at the words and their foundations, we note that L stands out with its use of the word "*conservação*", the only *Sanctity* foundation word in Figure 5.3. This is, however, misleading, since a quick browse through the program's use of the words will demonstrate that they are not "concerns about the behavioral immune system, physical and spiritual contagion", but concerns about the climate, cultural patrimony, and public property. On the other end of this foundation, in the *Degradation* dimension, the mentions of "*doença*" by the parties could also be misattributed. If we go back to the *Care* foundation definition - "concerns for the suffering of others" - we see that their preoccupation with the sick and even conservation comes from the same place, from caring about the people and even the patrimony.

The *Harm* dimension of the *Care* foundation might also be misleading. While "*combate*" is an aggressive word, it is mentioned to show opposition. It tends to go with topics such as corruption, disease, climate change, inequalities, and so on. Its moral value seems to stem more from the *Care* dimension than *Harm*.

The analysis of lexical choices across the political spectrum, as depicted in Figure 5.6, reveals a subtle divergence in the rhetoric employed by left and right-leaning parties. Particularly, it is observed that parties on the left frequently utilize the term "*proteção*" more frequently compared to their right-leaning counterparts. Conversely, the term "*segurança*" is employed less frequently by the left than by the right.

This lexical preference suggests underlying ideological priorities. The frequent use of "*proteção*" by left-leaning parties may reflect their emphasis on social welfare policies, which are often framed in terms of protecting vulnerable populations, safeguarding rights, and ensuring equitable access to resources. This aligns with the broader narrative of social justice and collective responsibility, central tenets of leftist ideology.

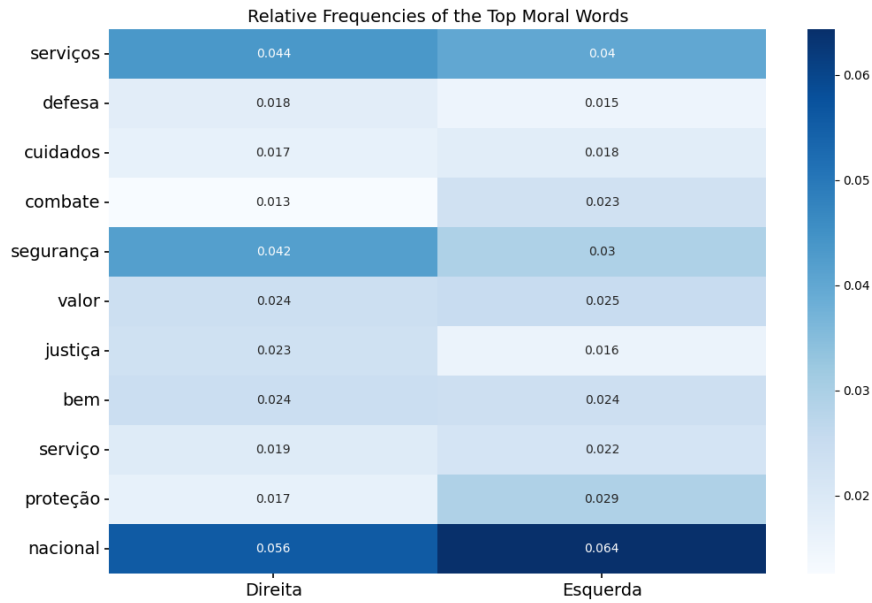


Figure 5.6: Left and right wing comparison of use of moral words

On the other hand, the right's preference for the term "*segurança*" could indicate a focus on law and order, and national security. This linguistic choice emphasizes a prioritization of stability, personal responsibility, and the protection of societal norms, which are cornerstone themes in conservative discourse. The different use of these terms is not just a linguistic choice but is indicative of the ideology of the political parties.

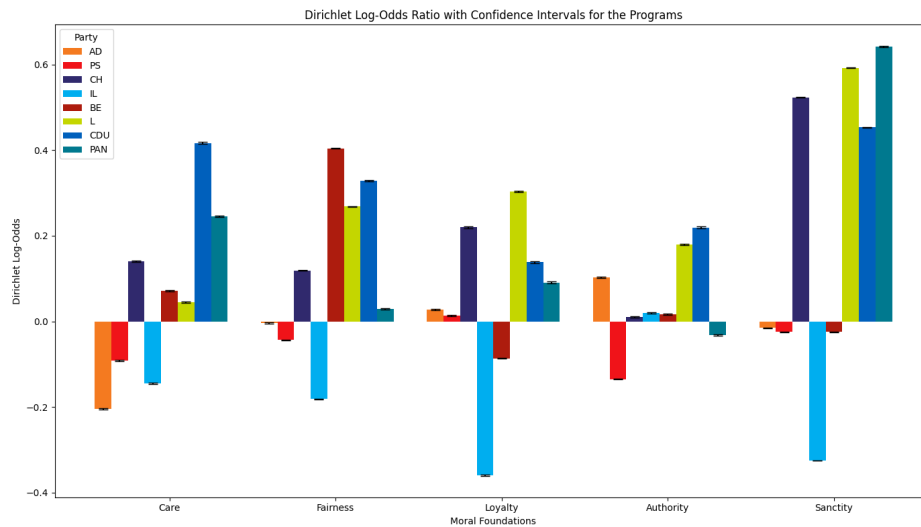


Figure 5.7: Dirichlet Weighted Log-Odds Ratio for the Programs

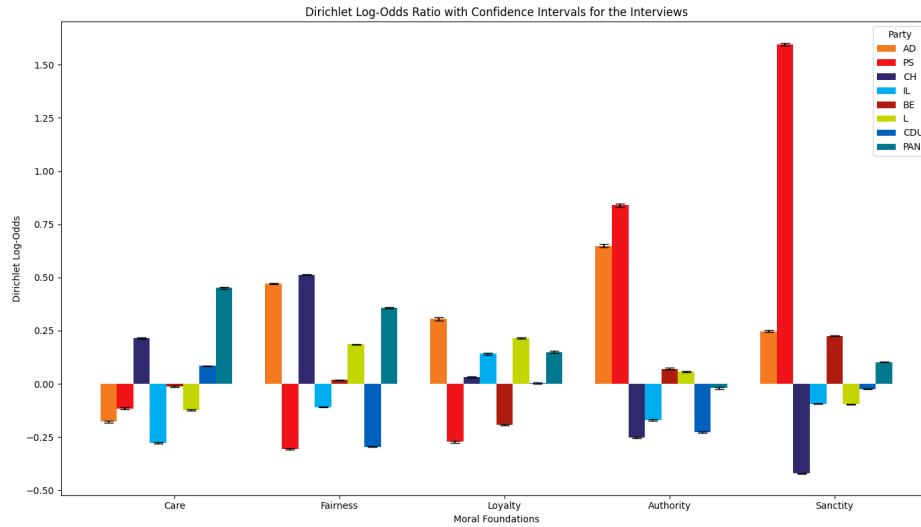


Figure 5.8: Dirichlet Weighted Log-Odds Ratio for the Interviews

The analysis of Dirichlet weighted log-odds ratios, illustrated in Figure 5.7 and Figure 5.8, provides an understanding of the relative importance of various moral dimensions across parties present in the programs and in the interviews, respectively.

Starting with AD, the coalition that holds the majority of seats in Parliament, the analysis indicates negative associations with *Care* (-0.204 ± 0.0013 for the programs and -0.178 ± 0.0085 for the interviews) and *Sanctity* (-0.015 ± 0.0007 for the program), suggesting a relative de-emphasis on these moral foundations compared to other parties. The strongest positive association is with *Authority* (0.103 ± 0.0014 for the program and 0.649 ± 0.0102 for the interviews). In the interviews, there is a significant increase in *Fairness* and *Loyalty*. In the programs, the party has an average moral association across the foundations, displaying some more pronounced associations in the interviews.

PS shows an abnormally strong *Sanctity* association during the interviews, but that is due to the leader name being Santos. The party has negative associations with most foundations in the program, with the exception of *Loyalty*, and while in the program it has a significant negative association with the foundation *Authority* (-0.134 ± 0.0013), in the interviews it is the strongest association (0.839 ± 0.009). Similarly to AD, it displays a subdued moral profile in the program, while displaying a more moral speech in the interviews.

CH exhibits positive associations across most foundations, particularly strong in *Sanctity* (0.523 ± 0.0009) in the program, where it has a negative association in the interviews (-0.421 ± 0.0024). In the interviews, it displays a strong association with *Fairness* (0.514 ± 0.003). The lowest association in the program is with *Authority* (0.010 ± 0.0015). In contrast, IL shows negative associations across most foundations in the programs and interviews, the strongest being *Loyalty* (-0.359 ± 0.0012), which in the interviews is the only positive one (0.141 ± 0.0054) and *Sanctity* (-0.325 ± 0.0005), with a slight positive association with *Authority* (0.0197 ± 0.0013 for the program and -0.170 ± 0.0053 for the interviews).

BE shows a strong association with *Fairness* in the program (0.404 ± 0.001) and negative associations with *Loyalty* (-0.086 ± 0.0014 for the program and -0.192 ± 0.0036 for the interviews).

L demonstrates positive associations across all foundations, expressing an emphasis on various moral foundations, notably strong in *Sanctity* (0.592 ± 0.0008), although it shows up as negative in the interviews (-0.095 ± 0.0024), where the associations are much weaker.

CDU exhibits strong positive associations in *Care* (0.417 ± 0.002) and *Sanctity* (0.453 ± 0.0009), indicating a favoring of these moral foundations within their party program. They also hold positive associations with all foundations in the program, whereas in interviews they display negative associations with *Fairness* (-0.297 ± 0.0024) and *Authority* (-0.228 ± 0.0033).

Finally, PAN shows positive associations in most foundations, notably strong in *Sanctity* (0.642 ± 0.0011), with a relatively weaker emphasis on *Authority* (-0.032 ± 0.0018). In the interviews, there is a higher association with *Care* (0.450 ± 0.0051) and *Fairness* (0.357 ± 0.004).

There seems to be a division between center parties, like AD and PS, showcasing average expressions of morality, and less moderate parties with stronger expressions of the moral foundations. An important concept to have in mind when interpreting these results is the concept of identification, by Burke (1969). Burke states that whenever there is an attempt at persuasion, identification occurs - one faction must identify with another to be persuaded. This identification process involves recognizing similarities, either real or perceived, between the persuader and the persuaded. He argues that identification is a foundational element of rhetoric, even more so than persuasion.

Stronger displays of moral language create a sense of unity among the identified. This process of identification helps to delineate in-groups and out-groups. Parties that strongly emphasize certain moral foundations effectively create a narrative that binds their supporters together through shared values and beliefs. Yet this same emphasis is also alienating all those who don't identify with this discourse, being a riskier strategy than a moderate affinity to moral language. The moderate exhibitions of moral discourse may be an appeal to a broader base.

IL stands out by exhibiting very low moral associations. This can be attributed to neoliberal emphasis on individualism, economic efficiency, and pragmatic solutions. Neoliberals regard inequality of economic resources and political rights not as an unfortunate byproduct of capitalism, but as a necessary functional characteristic of their ideal market system, according to Mirowski (2013). From their perspective, inequality is not only the natural state of market economies but also one of its strongest driving forces for progress. This belief system inherently conflicts with moral speech, which typically advocates for social justice, fairness, and equality. Consequently, neoliberals' emphasis on individualism and market efficiency over collective moral considerations explains their lower association with moral speech.

CONCLUSIONS

This study set out to investigate the rhetorical differences among Portuguese political parties, focusing on their emotional appeals and their moral profiles.

The sentiment analysis revealed a distinction between the emotional tendency of interviews and the more formal tone of party programs. Interviews with party leaders tend to elicit more emotionally charged responses, negatively skewed. This negativity primarily stems from criticism of the current political, economic, or social situation. This critical stance serves a strategic function: it sets the stage for the party's policy solutions. By highlighting perceived deficiencies and challenges within the existing system, party leaders create a narrative of urgency and necessity. This narrative not only justifies their proposed policies but also frames these policies as essential corrective measures. In this context, the negative sentiment expressed in interviews acts as a rhetorical tool, amplifying the perceived need for change and positioning the party's solutions as suitable responses to pressing issues.

With the moral foundations analysis, we were able to depict the moral profiles of the Portuguese parties. Unlike the American liberal/conservative dichotomy, observed by Haidt and Graham (2007), the Portuguese left isn't limited to the Care and Fairness foundations, which are the foundations most emphasized by American liberals. In Portugal, Care, Loyalty, and Authority are the foundations with the highest emphasis across all parties, according to the LWIC methodology. The weighted log odds ratio analysis reveals that left-wing programs exhibit a stronger affinity towards Fairness and Sanctity, while center parties hold average moral associations. Notably, left-wing programs consistently show higher associations with moral foundations, with CH displaying moral associations comparable to those of left-wing parties. This supports C. Costa et al. (2021)'s findings on the communication style similarities between left-wing parties and CH. Additionally, IL demonstrates the lowest association with moral speech, reflecting its neoliberal ideology. They appeal to a constituency that values economic outcomes over moral or ethical rhetoric.

The left/right division is further supported by the analysis of word choices, which reveals a distinct difference between the moral foundations emphasized by left-wing and right-wing parties. This distinction is particularly evident in the interviews, which tend to be less formal and rigid. In these settings, right-wing parties predominantly use moral words related to Authority, reflecting their ideological emphasis on order, tradition, and respect for hierarchy. In contrast, left-wing parties prioritize moral words associated with Care, emphasizing their focus on empathy, and social welfare. This differentiation in moral language highlights the divergent ideological frameworks and communicative strategies employed by these political groups.

The moral profiles of the parties also exhibit varying strengths of association. For instance,

AD and PS tend to have a softer discourse in both emotional and moral dimensions. However, this changes in the context of interviews, where both parties show strong associations with the Authority foundation. This shift can be attributed to their established positions in parliament, which likely necessitate a discourse that emphasizes stability and responsibility. This alignment with Authority in interviews may reflect their strategic need for project leadership and governance capabilities.

The moral analysis revealed a division between programs and interviews, supporting the disparity found in the sentimental analysis. Programs are meticulously crafted documents, that present a pragmatic policy agenda and are composed by the whole party. Interviews are less rigid, allowing for a more dynamic and humane form of communication. Not only are interviews permeated with the leader's personal ideology, which is diluted in the program, but also tend to focus on a scope of the most contested issues. CH and PAN's leaders exhibit the liberal stereotypical moral profile, with significant associations to Care and Fairness. AD's leader's interview discourse exhibits more substantial associations to moral language than AD's program does, while for L and CDU the opposite is true.

Graham et al. (2012) argues that polarization between the left and right-wing stems, in part, from the motivation to maximize distinctions between one's political in and outgroup, resulting in an overestimation of how much both sides differ. The findings corroborate this, as while the parties display differences, they also display notable similarities in their moral characterizations, despite frequently emphasizing their distinctions. This similarity might result from the constraints of discourse when constructing a political program, leading to profiles that are more similar than the ones resulting from parliament speeches, for instance.

This study is limited by the amount of data analyzed. Although the legislative programs are pillars of a party's identity, they can only provide a limited amount of information. It was logical to analyze them, particularly in an election year, to see what insights might arise. However, a more in-depth comparative analysis of the parties is still necessary to reach a more concrete understanding. Another limitation is the moral foundations dictionary, which is a translation of an American dictionary, and doesn't capture the nuances of the Portuguese language fully. A revision of this dictionary, considering the Portuguese context, is necessary for further future work in this field.

To address these limitations, future research could incorporate a broader range of data sources, such as parliamentary speeches, debates, and public statements. This would provide a more comprehensive view of the parties' rhetorical strategies and moral profiles. Additionally, developing a tailored moral foundations dictionary for the Portuguese context would enhance the accuracy of the analysis and provide deeper insights into the moral pillars of the Portuguese language.

In conclusion, this study contributes to the field of political linguistic analysis by highlighting the nuanced differences in the rhetorical strategies of Portuguese political parties, particularly by analyzing these differences across the ideological spectrum through a sentimental analysis and moral lens. This approach provides a comprehensive understanding of how language, morality, and emotional tone intertwine to shape each party's identity and communication style.

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APPENDIX



Figure A.1: Average sentiment across programs and interviews



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